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09/734,523	12/11/2000	Robert J. Collins	RS001US	4627

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Merle W. Richman, Esq.  
P.O. Box 3333  
La Jolla, CA 92038-3333

EXAMINER

JONES, SCOTT E

ART UNIT

PAPER NUMBER

3713

DATE MAILED: 05/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 09/734,523	<b>Applicant(s)</b> COLLINS, ROBERT J.	
	<b>Examiner</b> Scott E. Jones	<b>Art Unit</b> 3713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 March 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 124-141, 143 and 147-150 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 124-141, 143 and 147-150 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This office action is in response to the amendment filed on March 4, 2004 in which applicant amends claims 141 and 143, cancels claims 142 and 144-146, adds claims 147-150, and makes remarks regarding the Teder and Mihran references. Claims 124-141, 143, and 147-150 are pending.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

- On page 22, line 21, “self” should be changed to “shelf”..

Correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 124, 127, 134, 136, and 138 are rejected under 35 U.S.C. 102(b) as being anticipated by Teder (U.S. 5,700,204).

Teder discloses an apparatus and method for determining parameters of motion regarding a struck projectile (golf ball). Teder utilizes a Doppler microwave speed sensor to measure the apparent speed of a struck golf ball, along with determining other parameters relating to the projectile. Teder additionally discloses:

Regarding Claims 124, 134, and 138:

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- aligning a plurality of electro-magnetic energy transmission paths to be non-parallel to the objects substantially non-curvilinear movement path section (10) (Abstract, Column 7, lines 37-43, and 60-63, Column 8, lines 19-22, Column 9, lines 6-8, Column 22, lines 60-62, Figs. 1 and 16);
- reflecting electro-magnetic energy from each of the plurality of transmission paths off the object for at least a portion of the substantially non-curvilinear movement path section (Abstract, Column 10, lines 12-43, Column 20, line 9-Column 21, line 48, and Figs. 1, 4, and 16);
- receiving the electro-magnetic energy reflected off the object from each of the plurality of transmission paths (Abstract, Column 10, lines 12-43, Column 20, line 9-Column 21, line 48, and Figs. 1, 4, and 16);
- determining one of a movement direction, spin rate, spin axis, and spin axis orientation of the object based on the reflected electro-magnetic energy received from each of the plurality of transmission paths and while the object was traveling in the at least a portion of the substantially non-curvilinear movement path section (Abstract, Column 10, lines 12-43, Column 20, line 9-Column 21, line 48, Column 23, lines 26-35, and Figs. 1, 4, and 16).

Regarding Claims 127, 134, 136, and 138:

- the object is a golf ball and the substantially non-curvilinear movement path section is located within several feet of the location where the golf ball is struck (Column 8, lines 32-33, and Column 21, lines 45-48).

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***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 125, 126, 128-133, 135, 137, 139-141, and 143 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teder (U.S. 5,700,204) in view of Mihran (U.S. 6,244,971).

Teder discloses that as discussed above regarding claims 124, 127, 134, 136, and 138.

Teder discloses all the claimed subject matter except for:

Regarding Claims 125, 130, 135, and 139:

- applying an electromagnetic contrasting mark to the object.

Regarding Claims 126 and 131:

- applying a symmetrically shaped electro-magnetic contrasting mark to the object.

Regarding Claim 132:

- applying a plurality of electro-magnetic contrasting marks to the object.

Regarding Claim 133:

- applying a plurality of symmetrically shaped electro-magnetic contrasting marks to the object.

Regarding Claim 141:

- a symmetrically shaped area having an electro-magnetic contrast different from the ball remainder.

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Regarding Claim 143:

- the plurality of areas have a circular shape.

Mihran, like Teder, teaches of a method and apparatus for determining characteristics about a struck projectile, such as a golf ball or baseball and is therefore analogous art. Mihran, like Teder, also teaches of reflecting electro-magnetic waves off of a golf ball to determine flight characteristics, however, Teder's sensors/receivers send and receive signals non-parallel to the projected path of the golf ball, whereas, Mihran's sensor/receiver sends and receives signals parallel to the projected path of the golf ball. Mihran additionally teaches:

Regarding Claims 125, 130, 135, and 139:

- applying an electromagnetic contrasting mark to the object (Abstract, Figs. 3, 5, 7, Column 2, lines 42-52, Column 3, lines 15-20, and 58-61, Column 7, lines 9-31, Column 8, lines 13-26, and Column 10, lines 5-29).

Regarding Claims 126 and 131:

- applying a symmetrically shaped electro-magnetic contrasting mark to the object (Column 8, lines 13-26).

Regarding Claim 132:

- applying a plurality of electro-magnetic contrasting marks to the object (Abstract, Figs. 3, 5, 7, Column 2, lines 42-52, Column 3, lines 15-20, and 58-61, Column 7, lines 9-31, Column 8, lines 13-26, and Column 10, lines 5-29).

Regarding Claim 133:

- applying a plurality of symmetrically shaped electro-magnetic contrasting marks to the object (Column 8, lines 13-26) .

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Regarding Claim 141:

- a symmetrically shaped area having an electro-magnetic contrast different from the ball remainder (Abstract, Figs. 3, 5, 7, Column 2, lines 42-52, Column 3, lines 15-20, and 58-61, Column 7, lines 9-31, Column 8, lines 13-26, and Column 10, lines 5-29).

Regarding Claim 143:

- the plurality of areas have a circular shape (Column 7, lines 11-15).

It would have been obvious to one having ordinary skill in the art, at the time of the applicant's invention, to incorporate the electro-magnetic contrast features of Mihran in Teder. One would be motivated to use Mihran's contrasting marks in Teder because two or more symmetrical contrast areas on the ball increases the number of pulses generated while the transmitted radiation intersects the flight path of the ball. This is of particular advantage where the transceiver is of relatively low power with a limited sensing range because a greater number of pulses are obtained within the same portion of the ball's flight path.

7. Claims 147-150 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teder (U.S. 5,700,204) in view of Mihran (U.S. 6,244,971) and further in view of Cavallaro et al. (U.S. 6,292,130).

Teder in view of Mihran teaches all of the claimed subject matter as discussed above regarding claims 124-141 and 143 except:

Regarding Claim 147:

- determining a three-dimensional velocity vector.

Teder discloses using the actual path of the ball, rather than the straight-line path, in order to calculate a two-dimensional velocity vector. Cavallaro, like Mihran and Teder, teaches of a

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method and apparatus for determining characteristics about a struck projectile, such as a golf ball or baseball and is therefore analogous art. Cavallaro teaches of a system that acquires data via radar regarding the speed of a ball to compute a three-dimensional velocity via a Fourier Transform or Fast Fourier Transform. Cavallaro teaches:

Regarding Claim 147:

- determining a three-dimensional velocity vector (Column 2, lines 36-40 and Claim 34).

It would have been obvious at the time of Applicant's invention to incorporate velocity calculation methods of Cavallaro in the combination of Teder and Mihran. One would be motivated to do so in order to determine the trajectory and path of the ball in three dimensional space in order to report the data in a format suitable for use on a television broadcast, a radio broadcast, the Internet, a computer, or be made available to another software process or function.

### ***Response to Arguments***

8. Applicant's arguments filed March 4, 2004 have been fully considered but they are not persuasive.

9. Regarding claim 124, Applicant alleges Teder only teaches the determination of an object's one-dimensional velocity by monitoring the objects movement on a curvilinear path and therefore does not analyze the characteristics of a golf ball in a "substantially non-curvilinear" movement path. The examiner respectfully disagrees. After another careful review of Teder, the examiner did not see where Teder disclosed analyzing the characteristic of a golf ball on a curvilinear path. Applicant argues that this occurs since Teder models the effects of gravity, aerodynamic lift, and aerodynamic drag in the golf ball and therefore requires energy to be



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reflected off the golf ball while the golf ball's movement path is measurably influenced by the to-be-modeled effects, i.e. during the curvilinear segment of the movement path. However, the examiner respectfully disagrees. Applicant states on page 9 of the remarks that the initial movement path of a struck object (golf ball in the example) is substantially non-curvilinear. The examiner asserts Teder measures the characteristics at the same point in time and flight path as the instant invention. The examiner cites figures 2, 16 and column 8, lines 43-52 to support this position. The examiner notes the golf ball trajectory (10) in figure 16 is substantially non-curvilinear. Furthermore, Teder acquires data for the golf ball in a time range of about 50-220ms after ball impact as shown in figure 2. This is approximately the same time range that Applicant's invention acquires data for the golf ball as shown in figures 6 and 7 of the instant application. Therefore, the examiner believes Teder measures golf ball characteristics in substantially the same path section and time range as the instant invention. Therefore, the examiner believes Teder anticipates the claim.

10. Regarding claims 125-129, Applicant relies on the arguments provided for claim 124 to overcome the rejection. Please see item No. 9 above. Additionally, regarding claim 126, Applicant alleges Mihran does not teach using symmetrical contrast marks. The examiner respectfully disagrees. Mihran states, "For example, two or more contrast areas (60) may be symmetrically located on the surface of the ball (12) thereby increasing the number of pulses (72a) generated while the transmitted radiation (34) intersects the flight path (20) of the ball (12)." (Column 8, lines 15-19). Furthermore, regarding claim 129, Applicant alleges neither Teder nor Mihran teach the use of three or more transmission paths. The examiner respectfully disagrees. Teder discloses a multiple sensor embodiment that uses two transmission paths in

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figure 16 and column 20, line 9-column 21, line 48). Teder additionally discloses three or more sensors may be deployed, resulting in an even more highly constrained solution (Column 22, lines 60-62).

11. Regarding claim 130, Applicant alleges Teder does not teach how to determine a spin rate or spin axis orientation. The examiner respectfully disagrees. Teder contemplates this feature in column 23, lines 26-35. Additionally, Mihran teaches these features. Applicant alleges Teder assumes the spin rate is nominal in order to perform a curve fitting analysis. The examiner agrees Teder assumes the spin rate is nominal in order to perform a curve fitting analysis, however, this is for the initial launch condition of the ball rather than for the entire curve (Column 13, lines 30-31).

12. Regarding claims 131-133, Applicant relies on the arguments provided for claim 130 to overcome the rejection. Please see item No. 11 above.

13. Regarding claim 131 and 133, Applicant alleges Mihran does not teach using (a plurality) of symmetrical contrast marks. The examiner respectfully disagrees. Mihran states, "For example, two or more contrast areas (60) may be symmetrically located on the surface of the ball (12) thereby increasing the number of pulses (72a) generated while the transmitted radiation (34) intersects the flight path (20) of the ball (12)." (Column 8, lines 15-19).

14. Applicant alleges claims 134-140 are apparatus claims that parallel claims 124-133 and are therefore allowable for the same reasons. Please see item Numbers 9-13 above.

15. Applicant's arguments with respect to claim 141 and 143 have been considered but are moot in view of the amendment to the claims and the new ground(s) of rejection.

***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Welch '878, Hammerquist '194, Cavallaro et al. '665, Lieberman et al. '002, and Mihran '671 disclose devices and methods for determining flight characteristics of objects.

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

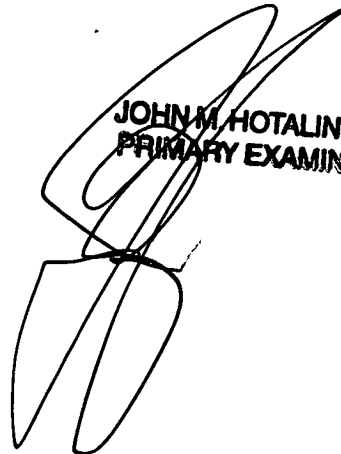
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott E. Jones whose telephone number is (703) 308-7133. The examiner can normally be reached on Monday - Thursday, 6:30 A.M. - 5:00 P.M..

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SEJ

sej

  
JOHN M. HOTALING, II  
PRIMARY EXAMINER